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Editor

FOOD HANDLERS' EXAMINATIONS Three Years' Experience in Los Angeles County

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From the inception of the food handlers' examination program in 1939 to July of 1942 approximately 30,000 (29,385) food handler examinations were performed in Los Angeles County, covering both urban and rural types of population.

In these examinations histories were elicited and physical examinations and laboratory tests were performed with a view to discovering the existence of any diseases, the spread of which could be prevented by control of food handlers. Included in the list of these diseases were the typhoid-dysentery group, diphtheria, tuberculosis, gonorrhea and syphilis.

Blood tests for syphilis were made routinely on first examination of a food handler. Genital examinations and smears for Neisserian infection, chest X-rays, throat cultures and urine and stool cultures were made where indicated by history and/or physical findings. Active as well as carrier states were considered in the examination.

In several districts, vaccinations were stressed in the second and third years of the program. In three districts routine chest X-rays were performed on a total of 1634 food handlers by the photoroentgen unit, using 4 x 5 inch films.

The appended tables reveal certain facts, an analysis of which follows:

Lues

In these 30,000 examinations, 1.15 per cent of the examinees gave a history of having lues; 42.3 per cent of whom proved to be nonluetic on subsequent exami-

nation. This high percentage of positive histories probably indicates that many of the people did not understand the nature of the disease about which they were questioned.

Two and eight-tenths per cent of the 25,900 blood tests performed were positive. Eighty-seven per cent of these cases were examined in our clinics, the balance being lost by moving out of our area. Eight-tenths per cent of the total number of food handlers examined, or 29.0 per cent of the total number of persons with positive Wassermann reports and examined in the clinics, were recommended for treatment. The other 71.0 per cent of these are either old, non-infectious cases or were already known and under treatment. Only three communicable or infectious cases of syphilis were found, 0.01 per cent of the total number of food handlers examined.

Gonorrhea

A positive history of having had gonorrhea was given by 606, or 2.06 per cent, of the total number examined. By this method only one active case was found, 0.003 per cent of the total number of food handlers examined.

It is our belief that there were more actual cases existent than were found, but the type of examination required for adequate diagnosis would be impractical because it would require a thorough genital examination by a physician qualified in this field, also much more extensive laboratory work. And even then, in the smoldering type of cases, smears are often ineffective and cultures are out of the question economically.

Tuberculosis

By the method of routine food handlers' examination alone, no active case of tuberculosis was found. Three of the districts routinely X-rayed a total of 1634 food handlers. Of these, seven (.43%) were found to have active tuberculosis. Three of the seven were allowed to continue work as food handlers because they were noninfectious. Fourteen (.86%) required further observation. The outcome of the 14 cases is not as yet known because sufficient time has not elapsed, but it is doubtful if any considerable proportion will be found to have active tuberculosis.

The conclusion to be drawn from the fact that the 30,000 examinations by routine methods disclosed no cases of tuberculosis, whereas only 1634 chest X-rays on unselected cases revealed seven, is that the food handlers' examination as a case finding program for tuberculosis is totally inadequate unless routine chest X-rays are taken.

Diphtheria

Five per cent of the examinees gave a history of having had diphtheria. No cases nor carriers of this disease were discovered.

Typhoid and Dysentery

Slightly more than 3 per cent of the food handlers examined gave a history of having had either or both of these diseases. An interesting side note may be made with regard to dysentery in that many of the applicants for a food handler's card answered "Yes" to this question when in reality they thought it meant "dentistry." This misconception was corrected at the time of the physical examination, however. *No cases or carriers of either of these diseases were discovered.*

Cost Analysis—General

Clinic cost (time of physicians, nurses, clerks, overhead of light, heat, paper, etc.)	\$0 83
Blood sample (laboratory work only)	0 24
Inspection (time and mileage for inspector to round up and follow up food handlers)	0 44
Total	\$1 51
Total cost for routine food handlers' examinations (29,385 x \$1.51)	\$44,371+

Cost Analysis—Lues

To arrive at a diagnosis of "syphilis" or "not-syphilis," the additional cost is \$2.14 for each patient referred to a clinic, allowing a margin for a few consultations not entered on the notes. The cost for this service was approximately \$1,600—732 persons having been referred to clinics. Since this follow up service in clinics is necessary to make a proper decision, the cost of the same must be added to the total cost of routine examinations to arrive at the true amount expended for the discovery of cases of syphilis, if we are to consider food handlers' exami-

nations as a syphilis case-finding procedure. (\$44,371.00+\$1,600.00=\$45,971.00.)

Infectious cases	3/45,971
	\$15,322 per infectious case found
Treatment recommended cases	243/45,971
	\$189 per case needing treatment

Cost Analysis—Gonorrhea

Inasmuch as very few cases were referred to the clinic, no clinic cost should be added to this figure. One case of gonorrhea was found at a cost of \$44,371, considering the food handlers' examinations as a gonorrhea case-finding procedure alone.

Cost Analysis—Tuberculosis

The cost of sending a patient through the tuberculosis clinic for a diagnosis of "tuberculous" or "non-tuberculous" status is \$6.50 per patient in our department. For the 102 cases referred, the cost was \$663. This added to \$44,371 gives a total of \$45,034.

Since *no active cases were found by routine food handler's examination*, it is obvious that no cost figure per case discovered without special examinations can be computed.

In the three districts in which routine X-rays by the use of the photoroentgen unit were made, 1,634 X-rays were taken at 88¢ per film (includes film, technician's time, overhead and supplies) which gives a cost of \$1,438. As a result of these, 97 persons were referred to clinics for diagnosis, which, at a cost of \$6.50 each, gives a total sum of \$625. The \$1,438 plus the \$625 equals \$2,063. Adding the food handlers' examination cost of \$1.51 for each of the 1,634 food handlers X-rayed (\$2,467.34) to the \$2,063 gives a sum of \$4,530 chargeable to this program for discovery of tuberculosis, seven cases of which were found. The cost, therefore, was \$647 per active case found.

COST FIGURES FOR REVAMPING THIS PROGRAM TO A SYPHILIS AND/OR TUBERCULOSIS CASE-FINDING PROGRAM ALONE

In order to bring the food handlers to the health center initially or for follow up, it has been found necessary to have the sanitary inspectors round them up. Therefore the necessary expense of 44¢ per food handler for inspection services is entailed for any type of program requiring the presence of food handlers at the health center.

The cost of running a Wassermann is 27¢ (laboratory only).

The cost of drawing blood (physician, nurse's time, overhead, etc.) is 55¢.

Therefore 44¢+27¢+55¢=\$1.26, unit cost per food handler for conducting a syphilis serology survey alone.

On the basis of the figures given in the present report, the annual cost for an average of 10,000 food handlers per year would be \$12,600.

With an expected rate of 3 per cent positive Wassermann cases being referred to clinics at \$2.14 apiece, this would amount to an additional \$642, or a total of \$13,242.

According to the experience which led to this report, one communicable case in 10,000 *would cost \$13,242 to find*. With 81 cases per 10,000 found needing treatment for their own future safety and the possible prevention of their becoming public charges, but possibly not from much danger of their transmitting syphilis, the cost of finding these previously unknown cases of syphilis would be \$164 *per case*.

In the case of tuberculosis it was found that routine food handlers' examination without chest X-ray was an ineffective method of finding cases of tuberculosis. Therefore X-rays must be included if this program is to be at all effective.

In 1942 the cost of 4 x 5 inch chest films was 88¢ per unit, and for 14 x 17 inch films it was \$1.58 per unit. With only two photoroentgen units in operation, part of such X-rays would have to be taken on standard 14 x 17 inch films. The average cost for all departmental X-rays was \$1.18. This \$1.18, plus the necessary 44¢ per food handler for inspection service, gives \$1.62 per food handler examined, or \$16,200 annually for 10,000 food handlers per year, on the hypothetical basis of adapting the food handlers' examination program to a tuberculosis case-finding procedure alone.

On the basis of 1,634 routine X-rays performed, 97 (or 6.0%) were referred to the clinics for diagnosis. Therefore, since diagnosis in the clinic costs \$6.50 per patient, 600 referrals out of 10,000 would cost \$3,900. This figure added to the \$16,200 gives \$21,100. Seven active cases out of 1,634 gives a percentage of 0.4, representing 40 cases out of 10,000. This number of cases divided into the total cost of the program, \$21,100, would be \$503 *per active case found*.

If this restricted program were aimed at discovering both syphilis and tuberculosis, it would cost \$2.44 per food handler to conduct the combined survey, or \$24,400 per annum for an estimated yearly load of 10,000 food handlers, exclusive of the cost of the additional necessary examinations to arrive at definite diagnoses.

In judging food handlers' examinations as a means of preventing the spread of communicable disease through the handling of food, a few additional comments should be made: (1) It is not only true that

such examinations are not outstandingly productive of cases of venereal disease, but such cases are of very little menace to the public through food handling. (2) While there is more danger of transmitting tuberculosis through food handling than there is of transmitting venereal disease, this danger is not exceptionally great, perhaps not greater than that of contracting the disease from other types of contact in public places with other types of people who have the disease without knowing it; and the percentage of open cases of tuberculosis found among food handlers even by routine X-ray and complete follow-up examinations is probably not greater than could be found among average men and women on the street. (3) As was found from many years of experience with food handlers' examinations in New York City, as well as by our own experience, such a means of detecting typhoid or dysentery carriers is practically barren of results. (4) The most complete and thorough food handler's examination, even though repeated every six months, can not protect the public against the spread of acute infectious diseases by food handlers. A food handler with beginning symptoms of such a disease is not likely to present himself for examination, and a person who passes an examination perfectly may contract such a disease and become a menace to others within a few days afterward.

SYPHILIS

District	Positive History	Positive Blood Tests	Referred for Treatment	Infectious Cases
Alhambra	47	56	8	0
Burbank	12	51	20	0
Compton	27	79	18	1
East Los Angeles	44	167	46	1
Glendale	35	57	23	0
Inglewood	4	17	5	0
Monrovia	12	45	8	0
Pomona	15	75	17	0
San Antonio	76	126	33	1
San Fernando	5	11	4	0
Santa Monica	2	9	2	0
Torrance	7	12	4	0
West Hollywood	30	84	34	0
Whittier	22	51	19	0
Total	338	840	243	3
Per cent of total	1.15	2.86	0.83	0.01

Per cent of persons with positive blood tests examined in clinic	87.0
Per cent of persons with positive blood tests needing treatment	29.2

GONORRHEA

District	Positive History	Active Cases
Alhambra	40	0
Burbank	45	0
Compton	44	0
East Los Angeles	62	0
Glendale	60	0
Inglewood	14	0
Monrovia	24	0
Pomona	42	0
San Antonio	105	0
San Fernando	23	0

GONORRHEA—Continued

District	Positive History	Active Cases
Santa Monica	6	0
West Hollywood	91	0
Whittier	43	0
Total	606	0
Per cent of total	2.06	0

DIPHTHERIA

District	Positive History	Active Cases	Carriers
Alhambra	154	0	0
Burbank	107	0	0
Compton	112	0	0
East Los Angeles	221	0	0
Glendale	39	0	0
Inglewood	36	0	0
Monrovia	101	0	0
Pomona	125	0	0
San Antonio	201	0	0
San Fernando	48	0	0
Santa Monica	28	0	0
Torrance	34	0	0
Whittier	118	0	0
Total	1,474	0	0
Per cent of total	5.0	0	0

ROUTINE CHEST X-RAY PROGRAM

Monrovia+East Los Angeles+San Antonio Districts

Total X-rays	Negative	Referred to Clinic
1,634	1,537	97
Per cent— 100	94	6
Arrested Cases	Active Cases	Observation Cases
76	7	14
Per cent— 4.65	0.43	0.86

TYPHOID AND DYSENTERY

District	Positive History	Active Cases	Carriers
Alhambra	96	0	0
Burbank	86	0	0
Compton	64	0	0
East Los Angeles	103	0	0
Glendale	43	0	0
Inglewood	35	0	0
Monrovia	69	0	0
Pomona	73	0	0
San Antonio	74	0	0
San Fernando	37	0	0
Santa Monica	20	0	0
Torrance	21	0	0
West Hollywood	90	0	0
Whittier	92	0	0
Total	903	0	0
Per cent of total	3.08	0	0

MORBIDITY*

Complete Reports for Certain Diseases Recorded for Week Ending December 19, 1942

Chickenpox

743 cases from the following counties: Alameda 93, Butte 9, Colusa 6, Contra Costa 16, Fresno 32, Humboldt 4, Kern 16, Kings 9, Los Angeles 135, Marin 9, Merced 16, Monterey 29, Orange 66, Sacramento 75, San Bernardino 8, San Diego 85, San Joaquin 51, San Luis Obispo 6, San Mateo 4, Santa Barbara 11, Santa Clara 25, Shasta 2, Solano 14, Stanislaus 3, Tehama 1, Trinity 9, Tulare 6, Yolo 2, Yuba 1.

German Measles

24 cases from the following counties: Alameda 8, Contra Costa 1, Fresno 1, Kern 2, Los Angeles 4, Orange 2, San Joaquin 3, San Mateo 1, Santa Clara 2.

Measles

74 cases from the following counties: Alameda 7, Butte 1, Contra Costa 1, Kern 1, Kings 1, Los Angeles 8, Marin 3, Merced 2, Orange

1, Plumas 3, Sacramento 1, San Bernardino 1, San Diego 2, San Joaquin 3, San Luis Obispo 1, San Mateo 33, Santa Clara 3, Shasta 1, Solano 1.

Mumps

345 cases from the following counties: Alameda 53, Contra Costa 8, Fresno 7, Humboldt 1, Kern 12, Lassen 1, Los Angeles 82, Monterey 4, Orange 17, Plumas 7, Sacramento 6, San Bernardino 5, San Diego 40, San Joaquin 56, San Mateo 13, Santa Clara 23, Solano 3, Stanislaus 2, Tulare 4, Yolo 1.

Scarlet Fever

120 cases from the following counties: Alameda 6, Contra Costa 2, Fresno 2, Glenn 1, Kern 7, Lassen 21, Los Angeles 26, Marin 1, Monterey 1, Orange 7, Plumas 1, Sacramento 13, San Diego 4, San Joaquin 2, San Luis Obispo 1, Santa Clara 5, Solano 2, Stanislaus 6, Sutter 1, Tulare 10, Yolo 1.

Whooping Cough

212 cases from the following counties: Alameda 52, Contra Costa 8, Fresno 1, Kern 14, Los Angeles 79, Marin 2, Monterey 1, Orange 12, Sacramento 3, San Diego 16, San Joaquin 2, San Luis Obispo 4, San Mateo 1, Santa Clara 8, Stanislaus 2, Sutter 1, Tulare 5, Yolo 1.

Diphtheria

19 cases from the following counties: Alameda 1, Contra Costa 1, Kern 1, Los Angeles 4, Monterey 1, Orange 1, Sacramento 5, San Joaquin 2, Stanislaus 1, Yolo 2.

Epilepsy

38 cases from the following counties: Alameda 1, Fresno 2, Los Angeles 28, Marin 1, Orange 1, Sacramento 1, San Francisco 1, San Joaquin 1, Tulare 1, Yolo 1.

Dysentery (Bacillary)

One case from Los Angeles County.

Encephalitis (Infectious)

One case from Kern County.

Influenza (Epidemic)

23 cases reported in the State.

Jaundice (Infectious)

One case from Merced County.

Malaria

One case from Los Angeles County.

Meningitis (Meningococcic)

2 cases: Fresno County 1, California 1.**

Paratyphoid Fever

One case from Los Angeles County.

Pneumonia (Infectious)

41 cases reported in the State.

Poliomyelitis (Acute Anterior)

7 cases from the following counties: Alameda 1, Kern 1, Los Angeles 3, Orange 2.

Rabies (Animal)

4 cases from the following counties: Fresno 1, Los Angeles 2, San Diego 1.

Rheumatic Fever (Acute)

3 cases from the following counties: Los Angeles 2, Marin 1.

Tetanus

One case from Los Angeles County.

Typhoid Fever

3 cases from the following counties: Los Angeles 2, Sacramento 1.

Typhus Fever

One case from Santa Barbara County.

Undulant Fever

4 cases from Fresno County.

Gonorrhea

210 cases reported in the State.

Syphilis

570 cases reported in the State.

* Data regarding the other reportable diseases not listed herein, may be obtained upon request.

** Cases charged to "California" represent patients ill before entering the State or those who contracted their illness traveling about the State throughout the incubation period of the disease. These cases are not chargeable to any one locality.

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